

CLAIMS

What is claimed is:

1        1. A method for de-screening a halftone image, comprising:  
2                performing a screen conversion filter upon a scanned  
3                        representation of said halftone image to produce an  
4                        intermediate image; and  
5                performing a line smoothing filter upon said intermediate image  
6                        to produce an output image.

1        2. The method of claim 1, wherein said screen conversion  
2        filter utilizes a 3 by 3 coefficient matrix.

1        3. The method of claim 2, wherein said coefficient matrix is  
2        diagonal along the lower right to upper left direction.

1        4. The method of claim 3, wherein coefficients  $c_{(-1, 1)} = c_{(1, -1)} =$   
2        1, and coefficient  $c_{(0, 0)} = 2$ .

1        5. The method of claim 2, wherein said coefficient matrix is  
2        diagonal along the lower left to upper right direction.

1           6.     The method of claim 3, wherein coefficients  $c_{(-1, -1)} = c_{(1, 1)} =$   
2     1, and coefficient  $c_{(0, 0)} = 2.$

1           7.     The method of claim 1, wherein said line smoothing filter  
2     utilizes a 3 by 3 coefficient matrix.

1           8.     The method of claim 7, wherein said coefficient matrix is  
2     diagonal along the lower right to upper left direction.

1           9.     The method of claim 8, wherein coefficients  $c_{(-1, 1)} = c_{(1, -1)} =$   
2     1, and coefficient  $c_{(0, 0)} = 2.$

1           10.    The method of claim 9, wherein said coefficient matrix is  
2     diagonal along the lower left to upper right direction.

1           11.    The method of claim 10, wherein coefficients  $c_{(-1, -1)} = c_{(1, 1)} =$   
2     1, and coefficient  $c_{(0, 0)} = 2.$

1           12.    The method of claim 1, wherein said screen conversion  
2     filter passes low-frequencies, passes high-frequencies along a diagonal  
3     line from lower left to upper right, and attenuates high-frequencies  
4     away from said diagonal line.

1           13. The method of claim 1, wherein said screen conversion  
2       filter passes low-frequencies, passes high-frequencies along a diagonal  
3       line from lower right to upper left, and attenuates high-frequencies  
4       away from said diagonal line.

1           14. The method of claim 1, wherein said line smoothing filter  
2       passes low-frequencies, passes high-frequencies along a diagonal line  
3       from lower left to upper right, and attenuates high-frequencies away  
4       from said diagonal line.

1           15. The method of claim 1, wherein said line smoothing filter  
2       passes low-frequencies, passes high-frequencies along a diagonal line  
3       from lower right to upper left, and attenuates high-frequencies away  
4       from said diagonal line.

1           16. A method for de-screening a halftone image, comprising:  
2       performing a single convolution filter upon a scanned  
3           representation of said halftone image to produce an  
4           output image, wherein said single convolution filter equals  
5           the resulting convolution of a screen conversion filter and a  
6           line smoothing filter.

1           17. The method of claim 16, wherein said single convolution  
2       filter passes low-frequencies, passes high-frequencies at a central area,  
3       and attenuates high-frequencies along a horizontal axis and a vertical  
4       axis.

1           18. A computer-readable medium having stored thereon  
2       sequences of instructions, the sequences of instructions including  
3       instructions which, when executed by a processor, causes the processor  
4       to perform various processing, the sequences of instructions  
5       comprising:  
6              a first sequence to perform a screen conversion filter upon a  
7       scanned representation of a halftone image to produce an intermediate  
8       image; and  
9              a second sequence to perform a line smoothing filter upon said  
10      intermediate image to produce an output image.

1           19. A computer-readable medium having stored thereon  
2       sequences of instructions, the sequences of instructions including  
3       instructions which, when executed by a processor, causes the processor  
4       to perform various processing, the sequences of instructions  
5       comprising:

6           a first sequence to perform a single convolution filter upon a  
7   scanned representation of a halftone image to produce an output image,  
8   wherein said single convolution filter equals the resulting convolution of  
9   a screen conversion filter and a line smoothing filter.

1       20. A system for de-screening a halftone image, comprising:  
2       a memory to store an input image from a halftone print; and  
3       a processor to perform a screen conversion filter upon said input  
4           image and create an intermediate image, and to perform a  
5           line smoothing filter upon said intermediate image and  
6           create an output image.

1       21. A method for de-screening a halftone image, comprising:  
2       converting dots of said halftone image into parallel lines of an  
3           intermediate image; and  
4       smoothing said parallel lines of said intermediate image into a  
5           final image.

1       22. The method of claim 21, wherein said parallel lines are at  
2       an approximately 45 degree angle with respect to a side of said  
3       intermediate image.